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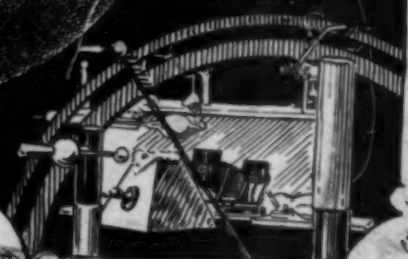
THE AMERICAN X-RAY JOURNAL

A MONTHLY DEVOTED TO THE PRACTICAL APPLICATION OF THE NEW SCIENCE AND TO THE PHYSICAL IMPROVEMENT OF MAN.



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THE AMERICAN
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Devoted to Practical X-Ray Work and Allied Arts and Sciences.

VOL. XII. CHICAGO, FEBRUARY, 1903. No. 2.

X-Ray Physics.*

BY T. PROCTOR HALL, PH. D., M. D.

The x-ray is produced by the impact of the kathode stream, or of its reflection, upon the inner surface of a Crookes tube. It is generally understood that the bulk of the x-rays start from the antikathode, where the kathode stream impinges upon it. The evidence, however, that has been presented so far is not sufficient to establish this view; and the question whether the x-rays are produced in any other way than by the kathode particles striking the inner surface of the tube remains open for further investigation. The kathode stream itself, it is now generally conceded, consists of particles of gas, which are projected with great velocity (nearly a mile per second) at right angles from the surface of the kathode. The kathode is made saucer shaped, so as to bring the kathode stream to a sharp focus on the antikathode, but since the particles in the stream repel one another quite strongly, the kathode is dished to a much greater degree than would at first seem necessary. In a very low tube the kathode stream is easily visible as a blue streak, and is seen to come to a focus at a short distance from the disk. This visibility is due to the vibrations of the gaseous atoms within the tube, which are relatively abundant in a low vacuum, and which are struck by the stream. In a higher vacuum the gaseous atoms are less abundant, and the light emitted by them as they are struck by the kathode stream is so faint that the stream itself can not be outlined.

Beyond the focus the kathode stream widens as the rays cross, and often the antikathode, instead of receiving all the stream, intercepts only a small portion and casts a sharply defined oval shadow upon the opposite wall of the tube. As the vacuum of the tube increases, the focus moves toward the antikathode. Some of the particles in the kathode stream, as they strike the wall of the tube with such great velocity, become entangled in it and remain there, diminishing to that extent the amount of gas in the tube; in other words raising the vacuum. These entangled particles can be restored to the gaseous condition by prolonged heating of the tube, so that the tube in which the vacuum has become too high for use can be restored to its normal condition by baking in an oven for an hour or two.

If the antikathode happens to contain some dissolved air or other gas when the tube is made, the first time it becomes hot some of the gas is driven out, lowering suddenly the vacuum of the tube.

A simpler plan for reducing the vacuum in a tube when it becomes too high is to use a capillary valve which allows the introduction of a minute quantity of air, as much as may be necessary. An-

*Read before the American Roentgen Ray Society at Chicago, December 10, 1902.

other plan which has been very successfully used is to place within the tube when it is first made a wire of palladium or some similar metal which has the power of holding among its atoms a large quantity of gas, which is driven out by heating. When it is desired to reduce the vacuum of the tube this wire is heated, either directly by a spirit lamp, or in another form of tube by causing the kathode stream to impinge upon it.

The kathode stream where it strikes the glass causes fluorescence, and if the stream is sufficiently impulsive gives rise also to x-rays. X-rays travel outward from the tube in straight lines, differing in this respect from the kathode rays within the tube, which can be slightly bent. X-rays radiate always. Up to the present it has not been found possible to bring them to a focus or make them parallel. They penetrate all substances to some extent. The substances most opaque to the rays are those having the greatest density and the highest atomic weight; namely, uranium (atomic weight 240), bismuth (210), lead (208), platinum and allied metals (atomic weight nearly 200). Of these lead is abundant and cheap and is therefore used for screening x-rays. Sheet lead 2 mm. thick seems to be a perfect shield.

X-rays are scattered to some extent by all substances. There is no very evident relation between the scattering power of a substance and its opacity to the rays. Rays that fall upon lead, iron, brass, copper or zinc are scattered little. Rays that fall upon silver, wood, or the human body are scattered much. Standing in front of a moderately high x-ray tube and looking into a fluoroscope in front of which is an opaque screen of lead, the screen is seen to be distinctly illuminated by means of x-rays reflected from near objects and especially from the body of the observer himself. These reflected rays obscure a faint shadow and greatly diminish the delicacy of the fluoroscope

The fluoroscope before you was designed by Dr. H. P. Pratt. Its box is made of metal, to exclude reflected rays, and it gives a much clearer shadow than is obtained in the ordinary instrument.

X-rays are all alike, so far as is known, except in their penetrating power. Those which are produced by a kathode impulse of great intensity, namely, in a high vacuum tube, in which the resistance is high, and therefore the electromotive force high, have very great penetrative power; it being easily possible, for example, to take a photograph thru a half-inch plate of steel. These x-rays, on the other hand, which are produced by a slight impulse of the particles of the kathode stream, have small penetrative power. In a given tube the penetrative power may be increased without changing the vacuum by increasing the resistance in the circuit outside of the tube, so that a higher electromotive force must be used, and greater impulsiveness of the kathode stream is secured.

The intensity of x-rays from a given tube, or, if you please, the number of rays per square centimeter, varies inversely as the square of the distance from its center; following the same law as gravitation, light, sound and all other radiating forces. In determining the effects of a given tube at varying distances a mathematical calculation in accordance with this law is necessary. For example at 1 foot from the center of the tube the rays are four times as powerful as at a distance of 2 feet from the center, nine times as strong as at a distance of 3 feet, sixteen times as strong as at a distance of 4 feet, etc.

In treating a patient the distance of the tube from the body affects the intensity of the application in the ratio given above, and it is worth noting that if the

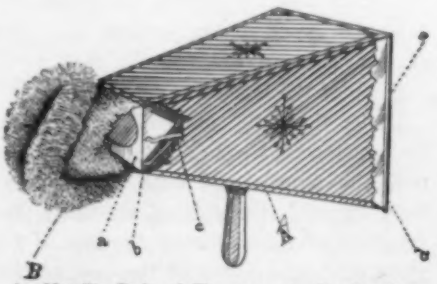
tube is very close to the patient a change of a single inch in the distance may cause a change of fifty per cent in the intensity of the treatment. For this reason it is advisable to treat with the tube at a distance of 10 or 12 inches, but if greater intensity is required, and the tube brot closer for this purpose, the distance must be carefully measured, else apparently erratic results will be obtained. There is another reason for not having the tube very close in treating tumors that have any considerable depth; namely, that the deeper part of the tumor is then treated with very much less intensity than the part near the surface, and the outer part of the tumor may be reduced in size, while the inner part is being stimulated to a more vigorous growth by the mildness of the ray.

The diffuse reflection of the ray from every part of the substance upon which it strikes makes it necessary to screen off all unnecessary rays, both in front of the plate and behind it, when great definiteness is required in an x-ray photograph.

The x-rays of high penetrative power, passing easily thru the tissues of the body, do very little work therein. Rays of lower penetration are almost wholly stopped in the tissues, and consequently produce in those tissues all the effect that they are capable of producing. For economy in therapeutic work, then, the tube should have its vacuum so regulated that the rays produced will be able to pass into and barely thru the part to be treated. If too high a tube is used, most of the rays pass entirely thru and waste their energy in the surrounding room. If the tube is too low the rays may be unable to reach more than the surface of the part to be treated.

The same remarks apply to a photographic plate. The rays from a low tube, being easily stopped by the film, produce a very distinct decomposition of the silver salts. Rays from a high tube passing thru a film leave only a slight mark. Since the photographic effect of the rays is cumulative, a lower tube can be used for photographing any part than could be used for examining the same part with a fluoroscope.

Several theories have been held regarding the character of the rays. The corpuscular theory, namely, that the rays consist of minute material particles projected thru the tube, is definitely abandoned. The wave theory, in some form or other, is now universally accepted. The theory of longitudinal ether waves, which was at first favored by Roentgen, meets now with little support; and the view that x-rays are electrical waves of some sort is almost unanimous. Indeed, when we consider that the only known source of x-rays is electrical, and that the most marked effects are also electrical, we can hardly avoid the conclusion that the rays themselves are electric disturbances. On this view, which was first proposed in 1896 by Dr. H. Preston Pratt, their electromotive force is the impulse of each particle from the kathode stream; the electric circuit is completed, as in other electric radiations, by the union of adjacent positive and negative rays at the end of their course, where their work is done; and there is in every substance some resistance to the ray, corresponding to (tho not identical with) electrical resistance.



A.—Metallic Body of Fluoroscope. B.—Opening. a.—Opening. b.—Lid. c.—Fastening of Lid. d.—Screen. e.—Glass Plate.

Systematic Records.*

BY M. I. WILBERT, M. D.
Director of the Radiographic Laboratory at the German Hospital, Philadelphia.

The value of written records will readily be admitted by any one that has ever attempted to burden his memory with a sequence of happenings or events for comparison or study. The use of such records is obvious, both as an aid to the memory in the study of a large number of events or happenings and as a reliable method of preserving an account of the more minor details. At the German Hospital, Philadelphia, written records of the x-ray work have been kept for upward of six years, and a considerable amount of valuable material has been accumulated.

The records have been continued in book form, in preference to using cards, because it was found that in practice, where a number of persons had access to the records, cards were at times taken out and not returned, or if returned were put away improperly. A system of card records would certainly be practical and economical in such cases where but a limited number of directly responsible individuals had access to the cards. The records kept at the German Hospital are in triplicate, and are arranged (1) under the serial number of the radiograph, (2) under the alphabetical index of names of patients, (3) under an analytical reference to the part of the body involved. Under the index we record the month and date, the name of the patient, the part of the body exposed and the serial number of the exposure.

Under the main, or serial, number entry, we record the number of the exposure, the month and date, the part of body exposed, the side of the body, the direction of the exposure, the size of the plate used, the name of the patient, the age of the patient, the number of the tube, the spark gap on which the tube is working at the time, the distance of the anode from the plate, the time of exposure, a short history of the accident, or an outline of the condition, and an account of the x-ray findings.

Under the analytical record we have again, the month and date, the name of patient, the age, sex, side exposed, serial number of the negative and the size of the plate. Then under different headings we have an indication of the x-ray findings for quick reference, and finally a more extensive or complete description of the x-ray diagnosis.

The entry in the serial number is made before the exposure is made, then this serial number is put on one corner of the dry plate with an ordinary lead pencil. This effectually prevents any subsequent exchange or mistake of the resulting negative. After the negatives are washed and dried the record is completed and the negatives themselves, wrapped in packages of four or five, are put away in lock corner wooden boxes for subsequent reference or study. Each package has the number of the inclosed negatives inscribed on the outside, and the wooden boxes when filled have a card attached giving the included numbers. While this plan of making a record may appear to be quite complicated, in practice it is very simple and takes but a few minutes to complete. With a systematically arranged book or a card but little writing is required, the major part of the entry consisting of figures or abbreviations.

For reporting the findings of the x-ray examination two separate blanks are used. For hospital cases a special blank form is filled out, and this becomes an integral

*Abstract of a paper read before the American Roentgen Ray Society, at its third annual meeting, Chicago, 1902.

part of the record or history of the case. For reports to the out-patient department we use the record card of the patient. For instance, when an out-patient is referred to the x-ray laboratory, he is given his record card and a request blank for the examination. After examining the patient the x-ray diagnosis is written on the back of the card, and the patient goes back to the proper department for treatment, the whole examination consisting of making the proper exposure, developing and fixing the negative, and subsequently examining the same in daylight, need not take more than 15 minutes.

For records of exposures made for therapeutic purposes, a separate book is used. This consists of an index for the patient's name, and properly ruled pages for the records. Each patient is given one leaf of the book, allowing for records of about eighty exposures. The page is headed by the name, age, and diagnosis of the patient, the remaining portion of the page is ruled to include a record of the following data: month and date of the exposure, number of the tube used, spark gap on which the tube is working, distance of the anode from the skin of the patient, and remarks of the progress or change in the condition of the patient.

The advantage of such a record is self evident. A complete account of any particular case at a glance is alone worth any amount of effort that would be required to continue such a record systematically.

The advantages to be derived from a systematic record of radiographic work are numerous, not the least among them being the ability to actually demonstrate the amount of work that has been done in the laboratory.

Routine Use of the X-Rays.*

BY M. I. WILBERT, M. D.
Director of the Radiographic Laboratory at the German Hospital, Philadelphia.

The possible information that may be obtained from an examination by means of the x-rays has been referred to many times. The advantages that are to be derived from the systematic and routine use of these rays in all cases where a bone lesion might be found have not been sufficiently discussed.

At the German Hospital, Philadelphia, it is the practice to refer all cases of severe injury to the x-ray laboratory for examination. In case the injury is an evident one the patient is not sent to the x-ray laboratory until after the existing deformity has been reduced and the proper dressings applied. Then a radiograph of the part is taken and this either confirms or corrects the diagnosis, and also gives a very satisfactory proof of whether or not the part has been properly reduced, or the dressings suitably applied. In addition to this we have a permanent and very satisfactory record of the nature as well as the extent of the injury. In minor accidents, where a bone injury cannot be demonstrated, the patient is referred to the x-ray laboratory before treatment is begun or any dressings applied. How important a satisfactory x-ray examination is, in cases of this kind, is evident when we remember the long train of symptoms that may follow an injury to a bone at or near its articulating surfaces. An incomplete fracture or even an infracture into the articulating surface of a bone can by excessive callus

*Abstract of a paper read before the American Roentgen Ray Society, at its third annual meeting, Chicago, 1902.

formation interfere to a very marked degree with the subsequent restoration of function of a part.

Just a few cases to show how important this may be, and to illustrate how very difficult it sometimes is to make a correct diagnosis from the clinical signs or the available history of an injury as given by the patient.

S. L., 47, female, fell backward down a number of steps and "landed all in a heap." There was evidently considerable injury about the left elbow, and from the clinical signs a diagnosis of fracture of the outer condyle was made. X-ray examination showed that the patient had a comminuted fracture of the head of the radius, and also a partial backward luxation of both bones of the forearm.

H. A., 35, male, while walking on a wet pavement suddenly slipped and fell, striking on the palm of his hand. Patient says that after his fall his left elbow hurt him some, but not markedly. During the night the elbow began to swell and became more painful. When he presented himself at the hospital there was marked swelling, some pain on attempting to move the elbow, but no crepitus and no deformity. An x-ray examination revealed an extensive infracture into the lower end of the humerus. This case also illustrates the importance of exposing all suspicious cases in at least two directions. A side to side view in this particular case did not show any evidence of a bone injury.

P. C., 11, male, bumped his right thumb in a fist fight some days before applying for treatment. The thumb and hand were very much swollen and quite painful. X-ray examination showed a fracture of first phalanx of thumb, near metacarpal articulation.

J. C., 35, male, was sent to the German Hospital with what was supposed to be an osteosarcoma of right ulna, about 6 cm. above wrist. X-ray examination showed that the patient had evidently had a fracture of the ulna without displacement. There was considerable callus, and this had given rise to the suspicion of malignant bone disease. Inquiry later elicited the fact that some three weeks before, the patient, while acting as a motorman on a street railway, had been struck on his arm by a released brake handle, and that his forearm had been painful ever since.

Cases of this kind could be duplicated by the score, but sufficient have been cited to illustrate the necessity of a complete and accurate diagnosis of an injury before proper treatment can be carried out.

Too much stress cannot be laid on the importance of at least recognizing all bone injuries that involve articulating surfaces. The possibly serious after effects in these cases should be sufficient excuse to warrant their careful and systematic examination by means of the x-rays.

Instantaneous Skiagraphy.*

BY MIHRAN K. KASSABIAN, M. D.

I have chosen this subject for my paper because of the fact that this matter is very largely misunderstood and hence neglected. The majority of x-ray operators overexpose parts, and when I make mention of this or demonstrate to them the possibilities and advantages of rapid skiagraphy, they become exceedingly surprised. Many of the "old timers" refuse at first to believe that such a thing as instantaneous skiagraphy is possible, and become converted only after seeing for themselves.

TIME OF EXPOSURE, 1¼ SECONDS.

Strictly there is no such thing as "instantaneous skiagraphy." By this phrase we mean the process of taking skiagrams of any part of the body with very short exposures. The time of exposure of one operator differs from that of another, so that thus far no universal standard has been attained. The time of exposure depends largely upon the size and character of the apparatus employed, the degree of vacuum of the tube, and the thickness of the part to be skiagraphed. The time of exposure has gradually been reduced from two hours (the time of exposure when the x-rays were discovered by Prof. Roentgen) to as many seconds, the time now in vogue. The minimum time now used by me in instantaneous skiagraphy is about one second; this being the time re-

* Read by title at the Chicago Meeting of the American Roentgen Ray Society, December 10-11, 1902.

quired to skiagraph the hand, and the time exposures necessary to skiagraph such parts of the body as the kidney, hip, skull, lung, etc., vary in direct proportion with the thickness of the parts. The following table will give you an idea of the time-exposures I employ for skiagraphing.

Head—
Face, 10-15 seconds.
Cranium, 40-60 seconds.
Thorax, 20-30 seconds.
Abdomen, 50-90 seconds.

This standard of exposures was attained after prolonged experimentations upon individuals that weighed between 125 and 145 pounds, and for any increase of weight (say for each 15 pounds increase) an addition of from 1 to 2 seconds should be estimated.

NORMAL SKULL. EXPOSURE 15 SECONDS.

Upper Extremity—
Hand, 1 second.
Wrist, 2 seconds,
Forearm, 3 seconds.
Elbow, 3-5 seconds.
Shoulder, 10-15 seconds.
Lower Extremity—
Foot, 5-6 seconds.
Ankle, 5-6 seconds.
Leg, 5-7 seconds.
Knee, 10-15 seconds.
Hip, 40-60 seconds.

The apparatus which I use is the Queen & Co. 15-inch spark coil, supplied with a 110-volt current. The tube should be of high vacuum; the resistance of the parallel spark gap being from 7½ to 8½ inches with a 3-inch spark gap in series to prevent blackening of the tube. The

distance between antikathode platinum plate and the surface of the part that is being x-rayed should be from 12 to 15 inches. The plate used is especially prepared for x-ray work, manufactured by the Cramer Co., of St. Louis. No intensifying screen is employed. All dressings and clothing should be removed and the part laid bare when using these short exposures. The time of exposure should be counted (in seconds) from the time the rays are penetrating perfectly (which is ascertained by using the fluoroscope), at the instant the shielding lead plate is removed. When a static machine is employed the time of exposure should be increased by 1/5 to 1/3. The time of exposure with a static machine depends upon the size and number of revolving plates and the number of revolutions per minute. I have used a mica plate machine which can stand a high speed without danger of breaking.

After the plate has been exposed it must be developed, and here is the point where individual skill is highly important. Most of the x-ray experts seem to be lacking in the knowledge how to develop the plate after it has been exposed to the action of the rays, and for their benefit I deem it expedient to give the following hints concerning the development of under-exposed plates: The developing solutions should be slightly stronger than the ordinary photographic formula; after the oxidizing power of the developer has been lessened by use, new or fresh solution should replace the old; and lastly the time of development should be lengthened, exercising care to not cause fogging of the plate.

The advantages of short exposures are the following: Avoiding the production of superficial burns; preventing the production of the secondary rays; and when taking a skiagraph of the lungs the plate

POSTERIOR VIEW, EXPOSURE, 25 SECONDS.

Acute Pneumonic Phthisis—whole left lung is hazy, indicating general infiltration and not consolidation; physical signs and clinical symptoms non-characteristic; case of four weeks duration; tubercle bacilli absent; notice the articulation of dorsal vertebrae.

will not be marred as the result of movement of the ribs and lung and diaphragm, which is always the case when long exposures are made. During short exposures the patient should be instructed to keep his mouth wide open. In renal, vesical and biliary calculi there will be no danger of the rays penetrating same, as is the case in long exposures. More differential detail is obtained by short exposures.

I shall contribute an exhaustive and more detailed report after I have completed my experiments in this line of work.

1831 CHESTNUT ST., PHILADELPHIA, PA.

Medico-Legal Proceedings.

Malpractice in Electro-Therapeutics.

WILLIAM H. MONTGOMERY, M. D.

CHICAGO

So far in this class of cases there has been no decision in any case by a supreme court and for this reason we are obliged to apply the general principles of common law to those cases which may come up in giving an opinion as to the probabilities of a verdict against the practitioner. In the first place x-ray work will no doubt be classed as a specialty and the principle of bringing to the aid of the patient "Ordinary knowledge and skill in his profession" will not clear the physician using it, for it will be held that as a specialist he must keep abreast of the times and make use of the latest and most approved methods and appliances, due consideration being given to the locality in which the physician is practicing, and it will be proper for the jury to decide, from the circumstances surrounding each case, whether or not he has fulfilled his duty in this respect. These points are well settled in the cases of Feeny vs. Spaulding, 89 M. 111, and McMurdock vs. Kimberlin, 23 Mo. App. 523.

There is no question but that a physician using the x-ray in Chicago will be required to possess a much greater degree of skill and proficiency in the use of these remedial measures than a physician located in a small town fifty miles distant, and the law will hold a physician to a strict accountability should untoward results occur in the use of the x-ray, for it is at the present time, in the eyes of the law, largely experimental, and whether its use was justifiable or not is a question to be determined by the jury trying the case.

The hazard is increased in this class of cases by the uncertainty of the effects of the x-ray as applied to different individuals, and farther that no judicial decision in a court of last resort has been rendered as to whether the use of the x-ray comes within the pale of medical treatment or not, and as no statute has been enacted upon this point there is really no law to apply.

The implied contract to follow established methods of procedure applies to this work, and I am of the opinion that when a final adjudication of this point is made it will take the character of an agreed method of procedure by experts in this particular line of work, upon the principle that every physician is entitled

to be judged by the principles of the school of medicine which he professes to practice.

It is essential that every operator of the x-ray give explicit and proper directions to the patient treated as to the care of any burn that may occur. It is also essential that no abandonment of the case, in a legal sense, is allowed to occur.

As the physician by his implied contract to his patient must use his best judgment, it is his duty to advise his patient whether or not the x-ray treatment will be of benefit, whether this opinion is asked for or not, and should he fail to do so he will be held liable for any damages that may accrue. Should he advise the patient that the use of the x-ray is improper, and against its use, and the patient insists on the treatment and in compliance with that insistence it is applied, we are of the opinion the courts will relieve the physician from any responsibility should injury occur.

In the cases so far tried in the lower courts, in all that have been brought to our notice, judgment in favor of the physicians has been rendered for reasons not germane to the actual effects of x-ray treatment, but from principles involved in the matter of evidence, contributory negligence, and of the procedure being taken along lines which could not be sustained by evidence; the incompetency of the attorneys prosecuting the case being quite apparent to an expert in medical jurisprudence, and for this reason we would caution physicians using this treatment in their practice, not to rely too much upon the fact that the verdict in the cases so far tried has usually been favorable to the defendant. To illustrate the above points, in the case of MacDonald vs. Shields and Jernigan and O'Connor, the latter being an x-ray specialist, lately tried, Dr. Shields was found to have had nothing to do with the case and Dr. Jernigan was merely an assistant. The entire operation was made by O'Connor, and as O'Connor was not served with any summons nor complaint in the action, in fact was not made a party to the action, in a legal sense, no case could be made out against him, and his share of the responsibility is the only one which interests us. The trial judge ordered the suit dismissed without letting it go to the jury *on these points,* none of which bear in any way upon the x-ray treatment. We note that the plaintiff in this case was severely burned by the ray and that she suffered epilation, leaving her entirely bald. We farther note that notice of appeal was given in this case, but the probabilities are that a new suit will be instituted against Dr. O'Connor for the reason that Drs. Shields and Jernigan could not be held to be responsible for the acts of Dr. O'Connor, under the ruling of the court as given above. It is found in these cases that the general rule holds which applies to all malpractice cases; that the physician is usually attacked by a comparatively incompetent and obscure attorney while he is driven to employ a much higher class lawyer to defend him; and as a consequence, in this new field, the inexperienced attorney is more largely at a disadvantage than where lines of procedure and decisions bearing upon the various points at issue are available to him, all of which has aided to bring about the favorable decisions in cases so far tried.

The practice of physicians of taking a written agreement from the patient relieving them of responsibility in case of untoward results and of any damages which may occur, is not binding in law, and in case of death could not be introduced as evidence in court, adverse to the interest of any party having an interest in the life or services of the deceased.

One point should always be borne in mind, and that is that in some individuals injury may result from exactly the same

treatment in all respects as that given another patient where no injury resulted. In what way this hazard may best be prevented is not within the scope of this article, and is within the province of the practitioner who makes x-ray treatment his specialty, rather than within the province of the specialist in medical jurisprudence.

In conclusion allow me to suggest that until a decision by some supreme court has been obtained, settling the status of x-ray treatment, practitioners should follow the most conservative lines in their use of electricity in general and the x-ray in particular.

Report made to the City Council of Chicago by the Hon. John E. Owens, City Attorney, which appeared in their Regular Proceedings, dated Jan. 12, 1903.

There are a number of physicians who make a business of appearing in personal injury cases, so-called experts appearing in case after case against the city for the same set of lawyers, and their testimony takes a wide latitude, both from scientific facts and matters of opinion for the benefit of the plaintiff. Anything in the symptoms of the plaintiff, any deviation from the normal appearance of the body, any outward symptom, is immediately attributed to the accident and as a consequence of the accident, and the defense has no way to controvert this sort of medical testimony, except by calling some reputable physicians to testify to purely theoretical questions based on the defense's theory of the case and may be far from the truth in the matter, but under the practice in this state it is the best that can be done under the circumstances. Many large verdicts are returned and judgments secured by venal medical testimony. Not only is the city mulcted by medical and legal harpies, but other corporations likewise. The defendants in personal injury suits in Cook County are at a disadvantage before juries and are often mulcted of heavy damages by the usual practice as followed in the state courts, by being denied the right of a true knowledge of the plaintiff's condition as ascertained by a medical examination by a disinterested physician, or a number of physicians, who will arrive at a conclusion as to the condition of the plaintiff in their best judgment, and give the court and jury their best opinion and judgment as to what extent the plaintiff in the action has been injured.

Under the practice in Illinois a medical examination is not compulsory on the plaintiff. He only suffers by the moral effect on the jury and refusal to submit himself for such examination as may be demanded of him from the court and before the jury, the defendant knowing, of course, such a demand can be legally refused, but hoping for its effect on the jury in the mitigation of damages.

Venal medical witnesses, experts and otherwise, often influence large verdicts for plaintiffs by their distortion and exaggeration of the plaintiff's symptoms that are absolutely untrue. Many large verdicts and judgments are secured for trivial injuries and gross fraud is often perpetrated upon the courts of Cook County by venal, biased and untruthful medical testimony. The remedy for these conditions is the amendment of the practice in Illinois so as to permit an examination of the person of a plaintiff, who claims such disabilities have resulted

from an accident to his or her person, by a reputable physician appointed by the court, who will, by nature of such appointment, be unbiased and have no interest in the outcome of a case and will give the court and jury a true and actual insight into the plaintiff's condition, and a true verdict can be rendered, based upon the actual merits of the case.

In order to remedy this evil, I would suggest that your legislative committee be instructed to secure the enactment of a law at the next session of the legislature, that the trial court and judge be empowered to direct the plaintiff in a personal injury suit to submit to a physical examination by one or more physicians or surgeons to be designated by the court or judge, and that such examination be had and made under such restrictions and directions as the court or judge shall deem proper, provided the defendant in an affidavit shall present to the court or judge satisfactory evidence that he is ignorant of the nature and extent of the injuries complained of.

I have introduced the x-ray into the trial of all cases where there is any question as to the nature of a fracture of any bone in the human body. By means of the x-ray an exact diagnosis of fractures and dislocations can be made. The process of repair can be watched and the exact condition known at any period. If there has been a fracture at any time or injury to the bony structure, the x-ray will reveal it even if several years have elapsed. Tumors and degenerations occurring in the bone as the result of injury can be distinguished from tuberculous affections, etc. Electrical diagnosis is another branch of medico-legal procedure which is very essential, especially in determining the amount of degeneration that may take place in the nerves and muscles, to locate the same exactly and clear up the diagnosis of many obscure cases. Exaggeration of symptoms and similar frauds are of no avail when electrical tests are made.

The Adjustment of Damage Claims.*

BY MASON B. STARRING,
Counsel to the Chicago City Ry. Co.

Not many years ago the caption of this paper was a subject which managers regarded in much the same light as that in which the modern horse first looked upon the automobile; it seemed sure enough an invention of the evil one and dead certain to hurt something or somebody, but with the growth of the street railway and the community it supplies with means of transportation, that cancerous growth, yclept damage claims, which had already fastened itself upon the steam roads, began to develop in the street railway body corporate, and as it grew so grew the study and care bestowed upon its treatment, and all careful managements have long since commenced to place experts in charge thereof. The successful adjustment of damage claims depends largely upon the personal equation; the personality and mental characteristics of claimant and adjuster are the prime factors in all settlements. No matter how fair a corporation may be, may its adjuster be never so able, yet if the claimant is so constituted as not to know fairness when he meets it, or so determined to bilk the company that no reasonable amount will appeal to his sense of right, then an adjustment must fail, and resort be had to the law; then, too, the question of locality

* From a paper presented to the American Street Railway Association, at Detroit, Mich., Oct. 18, 1902.

must be taken into consideration. Since cities are pest ridden with the itch for personal injury litigation; in Chicago, for instance, there seems to be from five to fifty "drummers" for personal injury suits to every personal injury, or person willing to claim one, to be drummed; and its taxpayers are even now being asked to add a large number of judges to the already large bench of the county in order to secure the trial of cases within a reasonable period of time after their commencement. What that city needs is not more judges, but an enforcement of the laws against champerty, barratry and maintenance. If I am rightly informed my own fair city is not by any means the only one suffering from such necessity.

To further the proper adjustment of claims of this class, a proper foundation must be laid at their very inception. * * * Some physicians think it to their interest to humor their patients, and having a natural distaste for antagonizing their patients by telling them that the complaints made by the patient and the conditions found by the physician have no reference whatever to the probable consequences of such an accident as that under consideration, leave them firm in the belief that all their troubles are due solely to the violence applied at the time of the alleged accident. This is especially true of pelvic and nervous disturbances of the fair sex; many a woman directs her doctor's attention for the first time to pelvic troubles subsequent to an accident, when her comfort and possibly her health for a life-time might have been subserved by consulting him promptly relative thereto when the first manifestations of disturbance made their appearance. Occasionally instances are met with where the courage to undergo voluntary torture for the sake of the few dollars that can be secured out of a claim, attains so abnormal a development as to amount practically to insanity. Of these strange phenomena an extreme example which came under my personal observation is so abnormal as to almost pass beyond belief by any person not confronted with proof. Shortly stated it was as follows: A woman physician, related to a fine family and of independent means, brought suit for damages. The only injury that she was able to show she sustained at the time the accident occurred was a slight sprain of one ankle. She was exceedingly heavy and in the course of the trial it developed she had had both breasts, weighing some twenty-eight pounds, excised and upon being asked the relation this operation had to the accident to her ankle or why she had it performed, she replied that it was done in order to lessen the burden of weight which her "poor sore ankle" was compelled to sustain. It afterward appeared that at some time antedating the accident she had undergone an operation known as oophorectomy for the purpose of bringing on an artificial menopause, in order that the conditions which nature had imposed upon her sex should not interfere with her attendance upon her duties as a physician. Subsequently to the trial and disposal of this case, it was said that having learned of an operation performed in France for the removal of flesh from the thighs she hied herself to Paris to try this operation.

Science has come mightily to the aid of the adjuster in throwing the tell-tale search-light of the x-ray machine upon the human anatomy. This marvelous discovery is effecting great and good results in all personal injury departments of those corporations which have had the good fortune to come in contact with, and secure the service of, an expert in its use; many and many are the cases of fraud and imposition which it has exposed, and a great, great many (how many I never have gone into the details to carefully ascertain) of the claims that bones have been broken or fractured in

steam or street railway accidents have thereby been shown to be mere frauds, and that no fracture or fractures existed. Previous to the invention of the x-ray instrument it was much more difficult for the adjuster to ascertain the truth in regard to this point. A limb placed in a plaster cast is thereby put beyond the close inspection of a physician, and it is manifestly impossible to compel the removal of the cast for the direct inspection of the wound; this afforded an easy and successful mask for deceit. Now, however, the x-ray reveals, almost at a glance, the real condition of the hidden bone. Could an instrument be invented which would as indisputably and as accurately determine the extent of injuries to nerves and muscles as this machine does to bones, the task of adjusting personal injuries would be greatly lightened and the uncertainty which prevents an always accurate decision would be very largely removed.

Facts are what win! He who can uncontrovertibly and openly place facts before a malingerer puts him at a disadvantage from which he can never recover. Facts, too, are the enemies of some physicians. Look out for the doctor who puts the plaster cast upon the unbroken limb. He is a stumbling-block in the path, but employ to meet him not one who has a beam to pluck from his own eye. Rarely should the attending physician, if honorable and a fair practitioner, be ousted from the care of his patient. Be the recovery of the patient never so good, if the company furnishes the surgeon who attends the injured person, by some perversion of mental vision it is claimed alike by patient, relatives and friends that he is and has been sent to the bedside of the patient to injure him in some occult way, and by so doing, affect detriment to his interests and protection to those of the street railway company, sight being lost of the fact that the complete and early convalescence and recovery of health of the patient is best for all.

A Recent Malpractice Decision, in which the Court Recognizes the X-Ray as an Approved Method.

A case of unusual interest to the profession is that brought in the Elkhart Circuit Court by Shelley against Dr. G. W. Spohn, of Elkhart, Indiana, for burns caused by the x-ray. The defendant procured a change of venue to the LaGrange Circuit Court, in which court the case was tried early in December last.

Dr. Spohn is a specialist of the eye, ear, nose and throat and has been using the x-ray in treating his patients for some time. The plaintiff came to Dr. Spohn last spring, suffering with a growth on the under left side of his tongue. Dr. Spohn diagnosed the growth as cancer and told the patient the only thing he could do for him was to treat him with the x-ray. The patient consented; the doctor told him of the uncertainties of a burn and then gave him about a dozen treatments, one each day for about two weeks. After the last treatment Dr. Spohn noticed a very slight dermatitis beginning on Mr. Shelley's face. He gave him a lotion to put on his face; no more x-ray treatments were given him, and the patient, after visiting Dr. Spohn a few times, left the city, he claimed, for treatment of his burns. He later brought his action for malpractice, claiming $10,000 damages and alleging that the burns were due to the doctor's negligence in not providing a covering

for the face to protect it from the action of the rays. He further alleged that he was directed to use his left hand to hold down the lower jaw during the exposures; that there was produced a severe burn on the hand, which has permanently crippled it; and that each exposure lasted an excessively long time. The doctor denied the complaint generally and set up contributory negligence on the part of the plaintiff.

Plaintiff appeared in court, his face showing no perceptible signs of having been burned, while his hand was badly distorted, a sore on the back, close up to the knuckle of the middle finger, on healing, having drawn up that finger and generally distorted the hand. The serious part of the case was therefore to explain away the injury to the hand. There was not much contention over the burned face. The doctor did not deny that the face had been burned. He contended that there was no way of telling what strength of ray would burn a particular patient, for a ray that would produce a dermatitis in the tissues of one person might not affect another at all. He said he used a medium vacuum tube and provided a suitable covering for those parts of the face which he wished to protect. At first this covering was a lead disc for two or three exposures, and then lead foil was used with other materals during the remainder of the treatments. These statements were all corroborated by the doctor's assistant, who attended each treatment, and who, during the most of the time, held the coverings on the face of the patient. The plaintiff testified that each treatment lasted thirty minutes, while the defendant and his assistant both testified that the treatments lasted from three to seven minutes. The questions of length of exposure and failure to use a proper covering were, therefore, one of fact entirely, with the statement of the plaintiff unsupported on the one side, and the statement of the defendant supported by that of his assistant on the other, and approved as good practice by his experts. The plaintiff attempted to strengthen this part of his case by introducing photographs taken of himself showing the conditon of his face from time to time. They showed the face to be greatly swollen at first, so much so that he said that he could hardly see. But that fact counted for nothing when once the use of a proper covering was proved.

Plaintiff further contended that his eye was injured so that the vision was considerably affected. Defendant's experts examined the eye and found nothing unusual. So that charge failed. There was nothing left then but to explain the distorted hand.

The plaintiff alone testified as to the use of his hand as alleged. Dr. Spohn, corroborated by his assistant, said that the plaintiff continually used his hand to wipe the saliva from his chin, against explicit directions to keep the hand down; and that in doing so the covering would be knocked off the face, necessitating the cutting off of the current. The plaintiff was suffering considerably from the cancer and had little vitality during the treatments, and his restlessness, together with his persistence in wiping off his chin, which, of course, was underneath the covering, brought his hand up to or near the path of the rays, and it would have been acted upon by the rays had there been no covering.

Defendant's experts took the view that the x-ray, when it burns at all, produces a dermatitis upon the tissues in the path of the rays, the greatest effect being where it is the strongest. In this case the rays were directed into the mouth of the patient, and accordingly they would be the strongest there. If plaintiff were required to use his hand to hold down his lower lip and jaw, as he claimed he was directed to do, it would be reasonable to expect to

find the burn the worst, if one should occur on the hand, where the hand approached the closest to the path of the rays, namely, on the tips of the fingers. These experts examined the hand of the plaintiff for that purpose, but found no evidence at all of burns on these parts of the fingers. Plaintiff could not then say that his hand mght have been so placed to his mouth that the back of it came into contact with the rays, while the fingers were out of the way. The simple experiment will show that the rays would probably be cut off altogether from passing into the mouth if the hand were so placed. The only reasonable explanation of the condition of the hand then was that it was due to an affection of some kind. This was considered by the experts to be accounted for by the hand coming into contact with the saliva when wiping off his chin the poisonous saliva getting into an abrasion of some kind on the back of the hand. Each expert so testified, and plaintiff could not dispute it, only by ridicule.

The case was very ably presented to the jury and it rendered its verdict for Dr. Spohn wthout much delay, and answered favorably each interrogatory propounded by defendant. Dr. Spohn's testimony was so clear and free from contradictions, and his statements were so accurately supported by his assistant, that the jury could not do otherwise than believe the defense. The case was too clear to leave any doubt. The point on which there seemed to be the greatest danger—that of the alleged burn to the hand—proved to be not so difficult when once the real nature of it was known. Plaintiff had no expert, save a few deposisions from physicians who were not present, to contradict defendant's experts, whose opinions were unanswerable.

There is little likelihood that the case will be appealed, although there is need of a precedent, there having been heretofore no x-ray case ever decided in any supreme court in the country. This case is so plainly one of fact that there is little chance of the Appellate Court reviewng it. It will assist in removing a sense of timidity which practitioners cannot help having in the use of the x-ray for the treatment of their patients. It is apparent by this case that the court did not consider that the defendant had made such a departure from the recognized methods of his school that he would be liable for any injury, whether or no he was negligent. But he recognized the x-ray treatment as one being quite generally adopted and used, and that the practitioner using it would be liable for ordinary negligence and for failure to exercise ordinary skill and care, just as any physician or surgeon is held.—*Medico-Legal Bulletin, Jan.* 1903.

Chicago Electro-Medical Society.

The eigtheenth regular meeting of the Chicago Electro-Medical Society was held in the Drill Room, Masonic Temple, on Monday evening, January 26. It was called to order by the president, Dr. Elmore S. Pettyjohn, at 9 o'clock p. m.

Minutes of the previous meeting were read and approved.

A. H. Reading, M. D., H. S. Tucker, M. D., S. S. Felker, M. D., F. G. Corbett, M. D., and Chas. Gilbert Davis, M. D., were elected to membership.

The following resolution, moved by Dr. Pratt, was adopted without dissent.

Whereas electric currents and x-rays produce effects upon the human body which are extremely valuable for therapeutic purposes, and which in the hands of persons who have not the necessary knowledge and training are liable to cause serious injury, therefore the Chicago Electro-Medical Society declares its unanimous judgment that every use of electricity and the x-ray upon any part of the human body should be by law defined as medical practice.

Under pretense of x-ray photography or of fluoroscopic examination any person may, as the law now stands, give a course of treatment with the x-ray. The law recognizes all other forms of medical treatment as belonging only to licensed practitioners. We see no good reason why the x-ray should be an exception to this rule.

The secretary is hereby instructed to transmit a copy of this resolution to the committee on medical practice of the state legislature at Springfield, Ill.

The following paper was then read:

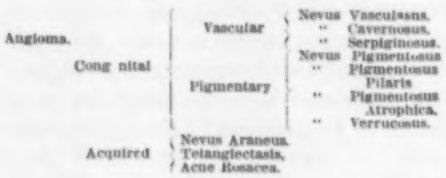
Angioma.

BY H. P. FITZPATRICK, M. D., PH. R.
Professor of Dermatology in the Chicago College of X-Ray and Electro-Therapeutics.

The practical dermatologist recognizes that all abnormal pathological changes in the dermal capillaries, whether congenital or acquired, whether purely vascular or pigmentary, should come under one general heading.

While the author of our textbooks recognize this intimate and direct connection, they nevertheless so scatter their treatises upon these vascular hypertrophies thruout their books as to leave the association wholly to the intelligence of the reader. To obviate this I suggest a general heading of "Angioma" for all pathological vascular or pigmentary changes of the dermal capillaries.

Under this heading we will find two main divisions—first, congenital; second, acquired, with subdivisions as follows:



It would not be possible to thoroly cover this subject in this brief article and therefore using the diagram as a basis for comparison, I will merely outline the most important subdivisions and their treatment by electrolysis.

There are three congenital nevi and three acquired that I want to consider briefly. Of the congenital we have:

First.—Nevus Vasculosus, a term generally limited to vascular distension of superficial blood vessels at or soon after

birth. They may be either bright red, purplish, or violaceous, the color depending upon the preponderance of arterial or venous capillaries. They may be located upon any part of the body but are found most frequently upon some portion of the head, preferably upon the face or neck.

This is the typical Birthmark and Port Wine Mark of the laity.

Second.—Nevus Pigmentosus and Nevus Pigmentosus Pilaris, the so-called Mother's Mark, a congenital pigmentation of the epithelial tissue of the skin frequenting the unexposed surfaces, in contradistinction to nevus vasculosus, usually a light brown or black, varying in size from a pin point to more than the breadth of the hand. Rarely, unless of the pilaris variety, do these marks cause sufficient annoyance to require extirpation.

But when covered with coarse hairs, and especially when located upon the chin, neck, or shoulders of the society girl, their removal becomes imperative.

Third.—Nevus Verrucosus, congenital warty excrescence extending, in all the cases I have examined, from the lower angle of the ear to the chest. This is a rare type but one that readily yields to electrolysis.

Of the Acquired Angiomas we have:

First.—Rosacea and Acne Rosacea. The first is an enlarged and engorged condition of the superficial capillaries of nose and cheek; a much milder form, but if not combated a pretty sure precursor of the more aggravated Acne Rosacea.

Second.—Nevus Araneus consists of a central anurismal vessel with a perfect network of minute capillaries as offshoots. From its resemblance to a spider's web it is frequently called Spider Cancer. Owing to their sudden onset as a bright red spot under the eye or on the cheek, with a tendency to rapid and continuous enlargement, they are frequently the cause of unnecessary alarm.

Third.—Telangiectasis, the so-called red nose, uncomplicated with Acne as in Rosacea, but frequenting the same localities of nose and cheek and simulating the same appearances in modified form.

These six subdivisions practically cover the field of vascular disfigurements.

All are amenable to treatment. In my experience no treatment is so effectual for complete eradication with minimum scar as electrolysis. Other treatments that have been used with fair or partial success are: (a) Sherwell's method, by multiple puncture with a set of fine needles in a holder, the needles being first dipped in a solution of chromic acid of from 30 to 50 per cent, are then inserted into the growth. Bleeding is arrested by compression and the parts are covered with collodion dressing.

(b) Squire's operation. Freeze the parts with ether spray and make numerous crossed and closely spaced linear incisions parallel to each other and in a plane obliquely directed to that of the integument.. Bleeding is arrested by compression and a dressing of collodion is applied.

(c) Sodium Ethylate, applied by means of a glass rod. This is powerfully caustic, and the resulting crust formation is supposed to obliterate the capillaries as in electrolysis.

(d) The ligature, (e) puncture with hot needles, (f) nitric acid, carbolic acid and other caustics, (g) multiple vaccination, and (h) excision, have all been employed more or less.

My method of treatment is invariably electrolysis.

With a single needle, preferably platinum, and from 2 to 8 milliamperes of current I transfix the vessels with the needle. As soon as these vessels become blanched I remove the needle and reinsert at the point of furtherest eletrolytic action, continuing treatment in this way until the mark has been thoroly covered.

I do not use a set of needles in a holder as some advocate. I find a single needle, and care in inserting, will accomplish more than a set of needles inserted haphazard.

In nevus pigmentosus pilaris I have seen the growth disappear entirely by the time all the hairs were destroyed—with electrolysis. You can undoubtedly destroy any form of so-called birthmark and as the pain is inconsequential and the patient can continue his vocation, and further, as the textural changes are insignificant, I would advise electrolysis in preference to all other known methods of treatment.

Discussion.

Dr. H. P. Pratt—This is a most interesting paper regarding the use of the needle. Birth marks are difficult to get rid of, and there are many failures thru lack of knowledge. Of late the x-ray treatment has been much used for this work, but the needle is equally effective, tho it has been much abused.

Dr. Stewart—My experience in this kind of work has been limited. I have used caustics but the cure is then worse than the disease. The needle is much less painful. Is much irritation set up?

Dr. Fitzpatrick—Yes, very much, but it subsides in 24 hours. A crust forms and the cicatricial contraction closes the capillaries. No anesthetic is necessary, as the pain is slight. In removing a mole, which is always elevated above the skin, thrust the needle thru it. This cuts off the circulation; a crust forms, and a new skin forms underneath on a level with that surrounding it. The crust falls off in about ten days leaving a pink scar which in two or three months changes to the natural color of the skin. Either positive or negative electrode may be attached to the needle, which must be of platinum. The positive electrode acts more quickly, but makes more scar tissue.

Dr. Pettyjohn—I had a patient with a red nose, supposed to be alcoholic, but which was caused by eating starchy foods which the patient was unable to digest. I treated the bowels and the red nose was cured. Patients are easily frightened. One lady waited ten years before applying for the removal of a mole, which was removed in three minutes by electricity. I used for this the negative current and connected the positive with a large electrode held in the hand. I inserted the needle before completing the electric circuit and used one or two miliamperes. It is better to give four treatments with too little current than one with too much. In removing hairs I have not used Dr. Massey's insulated needle, but have found no trouble with the operation. Nevi can be successfully removed with the electric needle. General constitutional treatment must be given at the same time.

Dr. H. P. Pratt related a case in which a practitioner had used a faradic instead of the galvanic current in an attempt to remove hairs, and of course failed.

Dr. Fitzpatrick—I put the positive electrode in a bowl of water on the patient's lap. When ready I have the patient put one finger in the water, then the second and third if necessary. Each additional finger decreases the resistance and increases the amount of current. A small sponge in the hand soon dries out.

Dr. W. D. H. Brown—The flannel electrode in the hand does not dry.

The following paper was then read:

Cell Tonics as Adjuvant to X-Ray Treatment.

BY HAMILTON FORLINE, M. D., CHICAGO, ILL.

A cell tonic and nutrient as an essential adjunct to the success of the x-ray in the treatment of certain malignant diseases has been called to my attention by some papers from the pen of Dr. H. Preston Pratt, in which he points out the importance of animal extracts in this connection because of their ready decomposition by the x-ray.

Dr. Pratt's experience with the x-ray as a therapeutic measure dating back to 1896 entitles him to rank as the pioneer in x-ray therapy, and gives special value to his opinions relative to some of its beneficial effects.

The papers to which I refer are an article published in THE AMERICAN X-RAY JOURNAL, July, 1902, and another read last December before the American Roentgen Ray Society, at Chicago.

In these articles he lays great stress on the value of assistant treatment; the wisdom of his conclusions has been brought forcibly to my mind by a case which I will presently cite.

The beneficial action of the x-ray in malignant disease seems to depend upon a destructive or solvent effect on the growth, thus throwing into the tissues for elimination certain effete products, which reduce the physiological resistance of fixed and motile tissue cells, or at any rate, as explained more accurately, there is produced as a result of the influence of the x-ray, ionic changes or ionic displacement. It would appear from this that a most valuable indication to be met in every case of malignant disease treated with the x-ray is the raising of cellular vitality by every possible means to the highest pitch; in other words, in addition to the ordinary hygienic regimen, those remedial agents must be employed which act most powerfully as tonics, nutrients and eliminants, and at the same time are easily decomposed by the x-ray.

Without going into recent advances in physiological chemistry, which remove some of the nebulæ surrounding vital phenomena, and which in part, at least, account for the action of animal derivatives, I wish to hastily describe the nature of the physiological action of the animal product referred to in the title of this paper, and to present a few practical results exemplifying, I think, its cell tonic potency.

This product is obtained from the hardy, common goat, whose great physiological resistance (because, perhaps, of its enormous lymphatic system) is greatly increased by special nutritive diet and hygienic surroundings. The parts used are the lymphatic glands and orchitic fluid removed under anesthesia, with the spinal cord and brain. These parts are immediately submitted to a high pressure of 300 atmospheres and combined with a preserving fluid containing a small quantity of chlorid of gold and sodium, after filtration thro porcelain under pressure. The active principles obtained from these organs by this process have been demonstrated to possess powerful cell tonic properties by extensive experimental as well as clinical data. It would be impossible and probably unnecessary for me at this time to go into the details of these experiments, as they have been ably described by Dr. Joseph R. Hawley, others, and myself, in the proceedings of the American Animal Therapy Association and elsewhere, with an overwhelming amount of clinical data. An agent which will produce a few curative, and in the majority of cases markedly beneficial, results in such diseases as locomotor ataxia and other degenerative diseases of the spinal cord,

in a few varieties of chronic nephritis, tuberculosis of all types, arterial sclerosis, and many other types of chronic disease, must of necessity possess great power as a cell tonic. As an eliminant it has been shown by accurate data to increase elimination through the kidneys, bowels, skin and lungs.

I will cite one case in which the remedy was used in conjunction with the x-ray. A man 55 years of age had been suffering from what had been diagnosed by some of the leading surgeons of the United States as a small-cell sarcoma of the ocular cavity. He had been submitted to all forms of treatment for this condition thru a period of twelve years, without any benefit. One year ago he was given treatment by the x-ray for this condition, and continued it ten months, without any change. At the end of ten months we started him with ten drop doses, twice daily, of this lymph compound, and at the end of sixty days of this treatment there was marked improvement in his condition. The inflammatory area was much diminished, and healing at this time seems active, with every evidence that a perfect recovery will take place. During this period the x-ray was administered every other day.

I am anxious that other medical men interested in the treatment of malignant disease should verify what appears in this case to be an excellent result.

This remedy is administered by a simple hypodermic injection in such cases, and inasmuch as it possesses unquestionably, as demonstrated in other cases, a localized cell tonic effect when injected near the seat of lesion, it would seem wise that it be tried in these cases near the body of the malignant growth itself.

Discussion.

Dr. Pratt—This is a very interesting case. In a paper read by request before the Illinois State Eclectic Medical Society I took the position that the x-ray changes the position of the ions of the body, thereby changing the elementary structure of the cells. It is necessary to give remedies that will be split up and taken possession of by the cells. The x-ray causes septic poisons to be liberated which we want to get rid of. This lymph contains protonuclein which is easily decomposed and made use of by the cells. The body consists essentially of 15 chemical elements, which are associated thru their electrical pull, changes of which bring about decomposition. Food entering the body is taken hold of by the ions and built into the structure of the tissues. The x-rays destroy abnormal tissues in malignant disease while the normal tissue must be built up by nutrition. The cells of cancer and tuberculosis must be split up electrically or you cannot destroy them. The x-rays furnish the necessary electrical force.

Prof. L. M. Rader, chemist, Chicago, expressed the opinion that the success of animal therapy depends entirely upon the composition of the proximate principle administered; and that it had been proven by some of the oldest investigators that goat's lymph owes whatever virtue it may have in a therapeutic way to the lecithin contained in its elementary molecules.

Billon obtained pure crystallized lecithin, and named it ovo-lecithin because he had found it in the egg.

Therapeutists now universally recognize that lecithin promotes the active metabolism essential to the proper nutrition of the organism. It is considered probable that this active metabolism is induced more by the tonic and regulating effects of lecithin upon the protoplasm of the nerve elements than in any other manner. At any rate its favorable influence

upon progressive metamorphosis is seen in the prompt increase in appetite and weight. Therapeutists have demonstrated its specific influence upon the ratio of the red blood corpuscles, and its marked influence in the rapid assimilation of albuminoids.

Lecithin exists in relatively small proportion in vegetable and animal substances, but no method of extracting it at a reasonable cost in a pure state was known till the investigations of Billon made it possible.

Various preparations containing phosphorus were long administered in the hope that lecithin would, in some unexplainable manner, be evolved and become available in the process of cell assimilation, but the results were indifferent. The older forms, such as the phosphate of calcium, or the preparations which followed, including glycero-phosphate of iron, calcium, magnesium, etc., have not proved capable of promoting the required changes of organic matter.

Exhaustive therapeutic tests have demonstrated that the work of Billon has given medicine a nerve tonic that not only ably re-enforces the power of the elementary molecule, but does it without danger or damage to the vital organs, as the heart, lungs or kidneys.

Aside from the immortal work of Pasteur, the production of pure crystallized lecithin by Billon is the most noteworthy achievement of the last half century in the realm of medicine.

The speaker cited cases where the x-ray being employed without notable advantage, the addition of lecithin had caused a marked improvement in all the symptoms, and *vice versa*, thus demonstrating Dr. Pratt's idea of it.

Reduction of the Vacuum in a Crookes Tube.

BY WELLINGTON T. STEWART, B. A., M. D.

CHICAGO, ILL.

What causes a Crookes tube to elevate in vacuum while in use? Suppose that a tube has not been exhausted. If we connect this tube in series with a generator capable of furnishing a spark as great or greater than the distance between the electrodes in the tube and place a shunt circuit across the line, having an air space equal to the space between the electrodes in the tube, we will find that the current will discharge equally over both.

If the tube is now exhausted to about 1/100 of an atmosphere, we will observe an effect very similar to that which occurs in a Geissler tube. The shunt circuit can now be closed to within one inch, and the current will not pass that way, showing that a tube exhausted to a certain degree offers less resistance than before, and the same follows until we carry our point of exhaustion to about one-millionth of an atmosphere. At this point we have what is termed a Crookes tube, capable of furnishing the Roentgen rays.

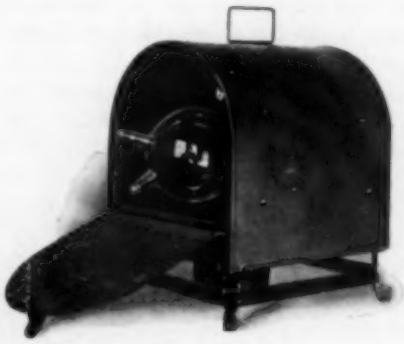
The tube has now been exhausted to a point capable of generating x-rays, and we find it works beautifully, backing up less than a one inch gap or shunt, and it is termed a soft or low tube. As we continue to use it, however, the vacuum rises.

In an exhausted tube the molecules are less numerous and therefore have greater freedom of motion when the tube is connected in series with a generator. The electrical energy is transmitted by means of the electrodes to the gas molecules within the globe. The stream is projected with considerable force against the kathode, or negative electrode, and in turn is

forced back against the anode. Striking the kathode with great force disintegrates to a certain extent the molecules of its substance. The kathode stream carries fragments to the target, a portion of which is deposited thereon and the balance projected, finding a lodgment against the inner structure of the glass on a line most marked where the fluorescing occurs, and where we find the greatest source of x-radiance. This point you can readily ascertain if you will examine the target of a high tube, and holding the tube itself to the light, see the marked line where the aluminum particles have been deposited. I believe that the force of these deposits are so intense that the gas is gradually buried or absorbed by the flying particles, thus raising the vacuum of the tube.

If you have any doubt about these deposits of aluminum on the target and the glass surface, you can easily verify the fact by destroying a hard tube and examining its target and the inner surface of the glass.

Some English writers have stated that a very high tube would give excellent results after having been baked for several hours. This led to the thought that the heat applied to the tube caused the metal particles to expand and liberated the gas which had been absorbed. The oven herewith presented was devised after a careful study, to obtain a uniform heat surrounding the entire tube, thus preventing any possibility of fracture, which would be liable to occur if heat were applied to one portion only. This device consists of an outer shell of sheet iron surmounted by a handle and lined with asbestos. Three-



quarters of an inch from the asbestos wall is another shell or wall of corrugated iron. Thru this wall are six rows of openings running parallel with the oven, which are so arranged that an equal distribution of heat is obtained in the entire chamber. The door consists of a double wall, openings in which allow for heat expansion. The device rests on a standard or table of sufficient hight to accommodate an alcohol burner or stove, consisting of a bronze cup filled with steel wool, 3½ inches in diameter and 2½ inches deep. A suitable handle is attached. Wood alcohol is the fuel employed.

This oven is the design of Mr. John McIntosh of the American X-Ray Company, to whom I am indebted for many of the suggestions contained in this paper.

It requires from five to fifteen minutes to satisfactorily reduce a tube.

Lupus with Report of a Case.

BY H. P. PRATT, M. D.

I wish to report to this society a case of lupus which has greatly interested me, and I am sure after you have heard the history, the subsequent treatment and final cure you will be interested also. It is a rare thing that a patient ever recovers from this disease where there is extensive destruction of tissue as in this case, and especially when in the location here involved. The patient was first seen by Dr. W. A. Pratt, September, 1900, with the following history. Mrs. H. S. C., age 40 years, American by birth, family history excellent. In 1893 a small pimple appeared on her cheek and had gradually enlarged in spite of all kinds of antiseptics and cauterizing treatment. It had given no particular pain at any time. Dr. W. A. Pratt found, on examination, a large ulcer extending from the inner canthus of the eye to about the lower margin of the lateral cartilage of the noze, and horizontally from a point opposite the center of the eye socket to the septum of the nose, exposing the nasal cavity on the right side. No definite diagnosis was arrived at at that time, but the opinion was that the case was one of lupus. Antisyphiletic treatment was given to clear up the diagnosis, but with negative results. The ulcer was dressed daily from this date for a period of 30 days. A solution of bi-chlorid of mercury and also peroxide of hydrogen were used as cleansing agents, and a dressing of boric acid applied, and this covered with a light pad of borated gauze. No bacteriological examination was made at this time to determine the nature of the trouble, but sebsequently this was done, which revealed its tubercular nature. At the expiration of thirty days the case showed improvement, the amount of pus was diminished and some granulations appeared. Dr. J. C. Delprat was called in consultation to determine the advisability of performing a plastic operation. Against the advice of the surgeons, the patient insisted on this being done, and on October 11th, 1900, a plastic operation was made by Dr. W. A. Pratt. Two flaps of skin were taken from the forehead with pedicles attached above the root of the nose, one being stitched to the mucous edges of the opening into the nasal cavity with the skin side innermost; the other was applied over this and covered nearly the entire ulcer, being stitched to the healthy skin surrounding it, with the skin side out. The operation was a failure, as had been anticipated, owing to necrosis of the flaps. The patient was sent to her home and supplied with corrosive sublimate solution and boric acid, with instructions to dress the ulcer daily herself.

In November, 1901, the patient returned to this city and was given treatment by dressings of about the same character as those that preceded. During the whole time the patient was given a tonic treatment, as she was inclined to lose strength and flesh.

When the patient was seen in November the ulcer had enlarged so that the left nasal cavity was exposed and about one-half of the lower eyelid was affected, as well as the inner part of the upper eyelid, the ulcer extending out farther on the cheek, there being but a small shred of the ala nasi remaining on the right side. At this time, the 15th day of November, 1901, I was called in consultation and advised x-ray treatments. At this time Dr. J. E. Harper examined the patient's eye, which was seriously injured by the disease. A film had formed over the eye, due to too

much exposure to light. We were considering the advisability of enucleation. On November 21st x-ray treatments were begun and continued daily until March 5th, 1902, when the condition present was that of healthy granulation. During all this time Dr. B. B. Masten dressed the ulcer daily. The absence of pus and everything being in good condition for another operation, it was performed by Dr. E. J. Farnum and Dr. W. A. Pratt. The condition before operation was as follows: All of the lower lid had been eaten away by the lupus. Also one-half of the upper lid and the cellular tissue around the canthus. The eyeball was entirely exposed. The conjunctiva and the cornea were ulcerated, and the latter was opaque. Sight had been permanently destroyed and enucleation was considered necessary to remove the source of irritation and to lessen danger to the sight of the other eye. A plastic operation was performed in order to build a new nose. Flaps were taken from the cheeks on both sides of the nose in order to accomplish this. The patient has fully recovered, has returned home and is in excellent health, with the ulcer entirely covered with healthy skin.

Constitution of the American Electo-Medical Society.

ART. 1.—*Name and Object.*

Section 1.—This society shall be known as the American Electro-Medical Society.

Sec. 2.—The object of this society shall be investigation in electricity and allied sciences and the encouragement of their application to medicine and surgery by the formation of district and local societies.

Sec. 3.—This society shall have complete supervision over the state and district societies, and shall be the court of appeals for said state and district societies.

ART. 2.—*Executive Council.*

Section 1.—All business of this society shall be entrusted to an executive council, which shall elect the officers, arrange for the annual meeting and the publication of the society's proceedings, decide all questions of membership and any and all business of whatever nature pertaining to the interests of the society, decide all questions on appeal from the state or district societies and report its proceedings to the society without unnecessary delay. The council shall elect its own chairman and such other officers and committees as it may deem necessary. The secretary of the society shall be secretary of the council, but this does not entitle him to a vote in the council.

Sec. 2.—The executive council shall meet on the day before the annual meeting for the transaction of business pertaining to the society, and again on the afternoon of the day before the final adjournment of the society to complete all unfinished business. Special meetings shall be called by the chairman on the written request of five members. One member of the executive council may vote by proxy for another.

Sec. 3.—The president of each state or district electro-medical society which is recognized as a branch of this parent society shall be a member of the executive council, and each state president who has served for one year shall continue to be a member of the executive council for the four following years, if during that time he remains a member of this society in good standing. These members, together with the president and all ex-

presidents, shall constitute the executive council of the society.

ART. 3.—*Officers.*

Section 1.—The officers of this society shall be a president, a vice-president from each state or district society, a secretary and a treasurer.

Sec. 2.—The president, secretary and treasurer shall be elected annually by the executive council.

Sec. 3.—The president of each state or district society shall be ex-officio a vice-president of this society. The vice-presidents shall rank in the order of the organization of the state societies.

Sec. 4.—The duties of these officers shall be those usually pertaining to their office.

ART. 4.—*Membership.*

Section 1.—All active members of this society or any of its branches shall be medical practitioners who are interested the state in which they reside.

Sec. 2.—Persons not legally qualified medical practitioners who are interested in the objects of this society, may become associate members upon complying with the other requirements for active membership. They shall be entitled to all the privileges of membership except that they cannot be members of the executive council.

Sec. 3.—When a state society is organized every resident member of this society shall be de facto a member of it, and thereafter only members of the state society in good standing in that state can become or remain active or associate members of this society.

Sec. 4.—Persons who are distinguished for investigations in electricity or allied sciences or in the application of the same to medicine or surgery may be elected to honorary membership by a two-thirds vote of the council. Honorary members shall pay no fees, shall not be entitled to vote, and cannot become members of the council.

Sec. 5.—Applications for membership shall be forwarded to the executive council and shall be reported upon by the president of the society of the state or district in which the applicator resides. The application shall be accompanied by the entrance fee of $3.00, which in case of election, shall be accepted as the dues for the next annual meeting, and in case of rejection shall be returned.

Sec. 6.—Membership in any recognized medical society, together with proof of the applicant's right to practice, shall be accepted as sufficient evidence that the applicant is in good standing, and shall entitle him or her, on compliance with the other requirements of the constitution, to membership in the society or any of its branches. The president and secretary of the local society of which he or she is a member shall sign the application blank with the applicant.

Sec. 7.—No application for membership shall be rejected by the council until the applicant has been notified of the objections against him and the persons by whom the objections are urged, and has been given an opportunity to defend himself. Any member who files against an applicant charges which he is unable to substantiate shall be deprived of all privileges of membership for one year.

Sec. 8.—The annual dues shall be three dollars, payable on the first day of the annual meeting. Members who are more than one year in arrears in their annual dues will, after notification, be dropped from the list of members, but may be reinstated within one year from that time upon payment of their dues in full.

Sec. 9.—Members guilty of immoral or unprofessional conduct may, after a hearing, be expelled from the society by a two-thirds vote of the executive council.

ART. 5.—*Annual Meeting.*

Section 1.—The annual meeting of this society shall be held at such time and

place as the executive council may determine.

Sec. 2.—At the annual meeting any ten members may appeal in writing from any act or decision of the executive council to the society, and a time during each annual meeting shall be set apart by the executive council for hearing such appeals and for the introduction of new business. The decision of a majority of the members present in regular session at such appointed time shall be binding upon the executive council. No new business shall be introduced to the society at such time except in writing on the motion of ten members.

Sec. 3.—Roberts' "Rules of Order" shall govern the proceedings of the society and its branches.

ART. 6.—*Official Organ.*

The American X-Ray Journal shall be the official organ of this society. Each member in good standing shall be entitled to receive it without additional expense.

ART 7.—*State Societies.*

Section 1.—A state organization of this society shall be known as the —— State Electro-Medical Society.

Sec. 2.—The officers of the state society shall be a president, one vice-president for each county society, a secretary and a treasurer.

Sec. 3.—The president, secretary and treasurer of the state society shall be elected by the state council annually.

Sec. 4.—The president of each county society shall be a vice-president of the state society. The vice-presidents shall rank in the order of the organization of the county societies.

Sec. 5.—The business of the state society shall be entrusted to a state council. The state council shall consist of: (a) the president of the state society; (b) all ex-presidents of the state society who remain members in good standing; (c) the presidents of the county societies in that state; (4) ex-presidents of the county societies who have served for one full year as county president and who remain members in good standing of the state society shall continue to be members of the state council for the four following years.

The secretary of the state society shall be secretary of the council, but this shall not entitle him to a vote in the council.

Sec. 6.—When a county society is organized, members of the state society resident in that county are de facto members, of it, and thereafter in that county only members of the county society in good standing can become or remain members of the state society.

Sec. 7.—The state council shall be the court of appeals for the county societies.

Sec. 8.—The membership fee for the state society shall be one dollar per year.

ART. 8.—*County Societies.*

Section 1.—Only one county electro-medical society shall be recognized in each county, but as many sections may be organized as are deemed necessary.

Sec. 2.—The officers of the county society shall be a president, one or more vice-presidents, a secretary, a treasurer, and such assistants as may be necessary.

Sec. 3.—The presidents of the sections, if any, shall be vice-presidents of the county society. Other officers of the sections shall be assistants to the corresponding officers of the county society.

Sec. 4.—The membership fee for the county society shall be one dollar per year, unless otherwise ordered by the society.

Sec. 5.—Rejected applicants for membership and members suspended or expelled may appeal to the state council.

Editorial Notes.

The American Electro-Medical Society.

It will be seen by the constitution which is printed elsewhere in this issue that the American Electro-Medical Society is broad in its scope, to bring together all those who are interested in this branch of medical work. It differs from the American Roentgen Ray Society and the American Electro-Therapeutic Association in being local as well as national, which we consider of the greatest importance. It differs from the American Electro-Therapeutic Association in not having an unlimited membership. The constitution as presented is clear and definite. All members will expect to belong to both county, state and national societies and thru the official organ will be able to keep closely in touch with every advance made either in the science or its application with a minimum of cost. Another feature that seems to us to be of great importance is the control of the state and national organizations on the representative basis. Prominence of policy is secured by some long term representatives but the democratic idea is thrown in, and is practically a referendum, with the provision that the executive council is bound to carry out the decisions of the national meeting. The utmost liberty is accorded to associate members. The only restriction laid upon them is that they cannot become members of the governing body. With this constitution it will be impossible for cliques or rings to obtain control of the national organization or for non-professional physicians to be sitting in judgment upon the ethical standing of physicians who apply for membership. The organization of this society meets with enthusiastic approval from every part of the country. Over a hundred members are now enrolled and applications are coming in fast. Any physician in good standing may become a member, be he a regular, eclectic or homeopath. No member will be allowed to oppose an applicant for membership upon personal grounds.

Electro-Therapeutic Guide.

This hand-book of less than 200 pages, by Drs. W. F. Howe and H. C. Bennett, is a concise introduction to the principles of electro-therapy. The language is plain and clear, and the illustrations sufficiently numerous. Some minor errors occur, but in spite of these the book will be found very valuable for reference by beginners in electro-therapy. 10 pages are devoted to x-rays; 35 to condensed instructions for the electrical treatment of particular disorders, and 28 to a glossary and index of electro-medical terms. The glossary alone is worth the price of the book. Published by The National College of Electro-Therapeutics, Lima, O. Price, cloth, postpaid, $1.00.

Correspondence.

DEAR DOCTOR:

I want to write you about a case of epithelioma of the lower lip. Patient about a year ago had an ulcerating spot on the lower lip removed by the application of a caustic paste in the hands on an itinerant. Result, the entire lower left half and a portion of the right half of the lip sloughed away. Tissue reproduced and healed with scar inside where infiltration began. The case was referred to me in October, 1902. On the 21st of October I began x-ray treatment, giving daily from 10 to 30 minutes until the skin showed severe reaction, then waited until the skin recovered, and began treatment again, pushing as before. It is now three months. The tumor has visibly decreased and the lip looks healthier, but the patient gets despondent and thinks the time too long. He has increased in weight and feels well. What has been your experience in these cases and shall I encourage him to keep on with the treatment? Will that scar ultimately soften and absorb. I am using a self-adjustable high vacuum tube. Any information you may impart will be gratefully received. I always await the coming of the X-RAY JOURNAL with pleasure, as it is a great source of information. Sincerely yours,

C. L. H.

[Keep on with your treatment. Lower the vacuum of your tube until you can barely see thru the fleshy part of the forearm. Treat daily ten to fifteen minutes and watch for a burn. When dermatitis appears omit one or two treatments and reduce the time of exposure. You have every prospect of a complete cure.—Ed.]

DEAR DOCTOR:

I see there is a quack in Detroit curing cases of deafness with a static machine, and as I have several such cases in my own town, I wish you would give me the treatment for them. Here is a case in particular: Fifteen years ago a man caught cold in the head, as he says; never got ear-ache, never suppurated, but has been deaf in one ear ever since. What would be your treatment in such a case. Hoping to hear from you soon, and thanking you in advance for your valuable information, I remain, Yours very truly, D. S. A.

[The causes of deafness under the condition described are so varied that with the information given it is impossible to do more than guess at the proper treatment. Possibly stimulation of the ear and throat by a mild use of the sinusoidal current or the hyper static might relieve the trouble. But it would be wiser to find out more exactly the condition before proceeding with the treatment.—Ed.]

H. PRESTON PRATT, M. D.:

Can the x-ray be depended on to remove hair from the face? I treat many ladies and remove them by electrical needle, a very slow and painful way.

About what distance should the tube be from the face, and what is the time of exposure?

I am a regular subscriber of the AMERICAN X-RAY JOURNAL, but have never seen anything on the subject. J. E. W.

[The x-ray can be depended upon for the removal of hair. Several articles on this subject have been abstracted in the Journal during the last few months. Use a low tube about six inches from the face and give five to ten minutes exposure. Guard with lead foil the parts you do not wish to expose. If the lead foil is in exactly the same position during successive exposures a dark line showing the position of this margin will appear and remain for some time after the hairs are removed. Be careful to shift the position of lead foil from time to time. The time required to permanently remove the hair depends upon the intensity of the ray from the tube and upon the depth and strength of the hair bulbs. It varies from ten days to two or three months.—Ed.]